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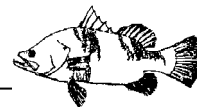
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Seabass grow-out and marketing: lessons from Australia, Malaysia, and Thailand

By **R Buendia**



A U S T R A L I A

Seabass, popularly known as barramundi in Australia, are highly valued foodfish throughout its range. Research work on seabass culture began in the mid-1980s to develop commercial and recreational fisheries.

There are three different methods used for growing barramundi in Australia. The first is brackish-water or freshwater pond culture. Usually, the fish are maintained in cages in ponds because of the difficulties in stock management and harvesting. Cage culture in estuarine waters is considered when large-scale production is envisaged. However, relatively few companies are using this technique primarily because of the difficulties in obtaining government approval to establish fish farms in

public waters and, to a lesser extent, biofouling and predation. The third method is intensive production in an indoor, controlled-environment building, using underground water (pathogen-free) and a high level of recirculation through a biological filter. Using this method, year-round production is possible and environmental concern associated with the release of nutrients to open waterways is avoided.

In Barramundi Waters, Australia's largest producer of cultured seabass, the fish are grown in floating cages in freshwater ponds. Fingerlings (15 cm) are stocked in $2 \times 2 \times 1.5$ m or $10 \times 5 \times 1.5$ m net cages at 100 kg per m^2 . Barramundi are fed by hand to satiation twice a day, every morning and evening. Floating pellets is generally given to minimize wastage and monitor the feeding activity of the fish. In other farms however, seabass are "reluctant" to feed at the surface when water clarity is high, hence sinking pellets are used. Fish are graded every two months during the 8-month rearing period. The high turbidity in ponds minimizes foul-

ing of mesh nets. Good aeration is maintained in the ponds using aerators and paddlewheels. Regular monitoring of water quality is undertaken and whenever necessary, water is exchanged. As quoted from the owner Chris Phillips, "the barra are tough and don't need large water exchange."

Harvesting and processing of the fish takes place at Barramundi Waters twice a week. Dip nets are used to catch the fish in cages while escapees from the cages are gillnetted from the ponds. Draining of the ponds is done once a year to make sure that no larger fish are present before the next crop is stocked. Harvested plate-size seabass (350-600 g) are killed by slitting the throat and letting the fish bleed in an ice brine. After gilling and gutting they are packed with ice in polystyrene boxes and air-freighted to the marketplace. The late 1995 selling price of gilled and gutted fish is US\$12.50 per kg and that of gut-in fish is US\$10-10.50 per kg. With increasing domestic demand of larger barramundi (2-3 kg) at an estimated price of US\$5-6 per kg for fish fillet, the seabass industry in Australia seems to have a bright future.

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M A L A Y S I A

Seabass are the most predominant fish cultured in cages in Malaysia. Although ponds are used, the bulk of seabass production comes from floating netcages because these are easy to construct, investment cost is low, farm management is easy and cages are versatile.

Most of the floating cage farms in Malaysia consist of wooden platforms supported by floats made of steel drums, fiberglass-coated styrofoam or plastic containers. The net-cages themselves are usually made of polyethylene netting, the mesh size of which varies according to the size of





the fish stocked. The common size of individual net cages used is 3 x 3 x 2 m. The cages are anchored to the seabed by means of concrete blocks, wooden pegs driven into the seabed, or by long metal or wooden poles.

Seabass are usually grown in calm and protected bays and lagoons where water current does not exceed 0.5 m per sec. A tidal range of around 1-2 m allows sufficient water exchange through the cages to wash away the feces and uneaten food and ensures an adequate supply of dissolved oxygen. The dissolved oxygen content of the water at the chosen location should not be less than 3 ppm. Clear water is an advantage as the nets will not be easily clogged by fouling organisms and silt particles. Seabass can grow well in 10-30 ppt salinity range. The depth of the water should be such that at no time are the cages touching the sea bottom.

Fingerlings of 2-3 inches in size are initially stocked at 15-23 per m³. As seabass grow, they are periodically graded and transferred to larger mesh size cages with stocking density reduced to 10-12 per m³. Trashfish are given once a day. The nets are cleared regularly of fouling organisms such as barnacles and seaweeds to ensure a clear flow of water through the cages. Seabass usually attains marketable size (500-600 g) in about 6-8 months with a survival rate of 60-80%.

Most of the seabass produced is consumed domestically, with high demand in seafood restaurants and five-star hotels. Home consumption is very limited. The ideal market size ranges between 600-700 g apiece. Ex-farm price of live seabass in 1994 is RM 15 apiece. In a restaurant, the price of live fish (later cooked) may range between RM 28-30 apiece.

The market for fresh or chilled seabass in Malaysia is comparatively smaller. The September 1997 wholesale price of chilled fish is RM 11-14 per kg (see also preceding article). Fresh or chilled seabass is normally sold through supermarkets and wet markets with prices ranging between RM 17-18 per kg.

Despite the high domestic demand, Malaysia also exports live seabass to neighboring Singapore as the market offers a better price. Live fish are transported by truck or by boat from the northern states of peninsular Malaysia to Singapore.

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THAILAND

Commercial-scale farming of seabass was made possible by research on artificial propagation by the Thai Department of Fisheries in mid-1970s. Seabass then became one of the most widely cultured and marketed fish in Thailand.

Seabass are reared in 5 x 5 x 2 m floating cages in coastal waters or stationary cages in shallow bays. Stocking of 25 cm fish varies from 12 to 300 per m³ depending on water quality and the environmental conditions of the culture site. More fish are stocked in floating cages than in stationary cages because they are usually in sites with deeper water, smaller fluctuation of salinity, more rapid circulation and further away from sources of pollution.

Fresh and clean sardines and other marine trashfish are the main feed of seabass. Trashfish are chopped to fit the mouth of seabass. Seabass are fed to satiation twice a day, in the morning and afternoon. Food conversion rates range from 4 :1 to 10:1. Normal growth and survival rates are 1 kg per yr and 80-95%, respectively.

The cages are checked once or twice a month to ensure that these are not damaged and to monitor fish number and health. Cleaning or changing of the cages is done every month. Cover nets are used to prevent fish from jumping out, especially when the sea is rough, and to prevent predation.

Seabass are reared for 5 to 20 months until the marketable size of 700-900 g and 2,000-3,000 g are reached. However, 700-900 g fish is preferred by the local market.

Thailand is a major consumer of cultured seabass. Domestic production is sufficient to cater to increasing demand. Thailand also exports seabass particularly to Malaysia when there is shortage of the fish in the Malaysian market.

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